Specification for Traffic Signal Controller Monitor Units (CMU) & Malfunction Management Units (MMU)

City of Mesa Transportation Department

Traffic Engineering
Intelligent Transportation Systems Group (ITS)

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Specifications and Standards Incorporated In this Document

1. ARIZONA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION: 1990.

2. ADOT TRAFFIC SIGNALS & LIGHTING: 1985 DIVISION OF HIGHWAYS STANDARD DRAWINGS.

3. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, TRAFFIC CONTROL SYSTEMS, AND NEMA STANDARDS PUBLICATION: TS1-1989.

4. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, TRAFFIC CONTROL SYSTEMS, AND NEMA STANDARDS PUBLICATION: TS2-2003.

5. INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC., WIRE AND CABLE SPECIFICATIONS: Current.

6. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS: USDOT/FHWA: Current.

7. AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS (AASHTO) STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS: Current.

8. MESA STANDARD DETAILS AMENDMENT TO THE UNIFORM STANDARD DETAILS: Current.

Documentation

The City reserves the right to reject traffic signal control equipment and auxiliary equipment items in which the manufacturer of such items does not have at least one million dollars of product liability insurance.

All bidders shall include with their bid submittal technical information necessary to fully describe the proposed equipment.

At the time of delivery, the supplier shall furnish fifteen (10) copies of the programming and operation manuals and 2 copies of the repair documentation for the equipment. The documentation shall include an itemized price list for each type of equipment, their subassemblies, and their replacement parts. This documentation shall also be provided on compact disk (CD-ROM) in Microsoft® Word or RTF format for text and AutoCAD® or DXF format for drawings/diagrams.

A permanent label with the serial number and date of manufacture shall be attached to each individual unit.

A list of serial numbers and manufacturing dates shall be provided with each shipment.

Warranty Statement

WARRANTY COVERAGE
The supplier of equipment shall warranty their product to be free from defect in design and operation and that it meets all the requirements of this specification and those incorporated in this document.

LENGTH OF WARRANTY
The term of warranty shall be a minimum of one (1) year from date of shipment. Vendor shall state length of warranty in writing.

PARTS AVAILABILITY
The supplier of equipment shall be able to provide replacement parts for a minimum of five (5) years after the warranty expires.

REPLACEMENT COVERAGE
All units shall be covered as follows: if a malfunction occurs during the warranty period, the supplier shall, within two (2) weeks after notification, furnish a like unit, module, or auxiliary equipment for use while the warranted unit is being repaired.

RELIABILITY CLAUSE
While under warranty, the isolation and repair of any unit malfunction shall be the responsibility of the supplier. Any unit experiencing a total of three failures that has twice been returned to the supplier for repair shall be replaced with a new unit of the same type at no charge to the City. The replacement unit's warranty shall be that of a new unit.

NOTE: Malfunctions do not include damage caused by lightning, power surges, negligence, acts of God, or use of equipment in a manner not originally intended by its manufacturer.

SHIPPING & HANDLING
During the warranty period shipping shall be handled as follows: The City of Mesa will pay for shipping the unit to the vendor and the vendor will pay for return shipping the repaired unit to the City.

Conflict Monitor Unit (CMU) Types

All CMUs shall be NEMA TS1 Type 6 and shall meet the following requirements:

1. CMU shall meet all NEMA TS1-1989 section 6 requirements.

2. CMU shall be menu driven.

3. All CMU displays shall be liquid crystal display (LCD) or plasma. All indicators shall be readable up to at least three (3) feet away from the display within a 90-degree cone from the center of the display. This visibility shall be maintained in bright sunlight.

4. CMU shall display the following status information with both light emitting diode (LED) indicators and its front panel display:

LCD and LED	LED Only
24 Volt I	Power
24 Volt II	PC Ajar
CVM	Microprocessor Fail
Conflict	
Red Fail	
Switch Fail	
Yellow Time Fail	

5. The current status of all channels shall be displayed (Red, Yellow, Green, and Walk).

6. CMU shall retain in non-volatile memory and provide a method to display at least 20 previous failures including time, date, and channel status.

7. CMU shall, as a minimum, store the last twelve (12) field terminal status changes. A method shall be provided so that this data may be accessed through the CMU serial port. This data is used to help determine what the intersection indications were prior to the occurrence of a fault condition.

8. CMU shall detect instances when the main AC voltage level is less than 96V (brown-out). This information shall be logged as a power outage in non-volatile memory and shall be capable of being shown on the CMU front panel display.

9. CMU shall provide for latching of 24V I, 24V II, and CVM failures. These features shall be capable of being enabled and disabled utilizing switches on the front panel of the CMU.

10. CMU shall provide for monitoring of yellow time failures. This feature shall be capable of being enabled and disabled on a per channel basis utilizing front panel switches.

11. CMU shall provide an adjustable value that is used as the minimum acceptable yellow time for all channels that have yellow time monitoring enabled. This value shall be adjustable from 2.0 to 15.0 seconds in 0.1 second increments utilizing front panel switches.

12. CMU shall detect an abnormal condition in which a combination of signals is present on a single channel. This feature shall be capable of being enabled and disabled on a per channel basis utilizing front panel switches.

13. CMU shall monitor for a walk only condition. This condition occurs when a walk is the only active indication on a given channel.

14. The programming board shall have quick release latches on both the top and bottom of its front edge to provide easy removal of the card from the CMU.

15. An RS-232 serial port shall be provided on the CMU. At least two (2) original copies of software and documentation to interrogate the CMU with a computer running Microsoft MS-DOS, Windows 3.x, or NT 4.0 shall be provided.

Malfunction Management Unit (MMU) Types

All MMUs shall be NEMA TS2 Type 16. **EDI MMU 16LE** or exact approved equal ***equipped with integral Ethernet Port.***